

#12- Rev. 1

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



SATURN V PROGRAM DIRECTIVE

NUMBER: 12

SUBJECT: Engineering Changes

ORIGINAL ISSUE DATE: May 6, 1965 REVISION NUMBER: 1

DATE OF REVISION: July 11, 1966 PREPARED BY: Saturn V Configuration Management
Branch, Phone 877-2607/CJohnson

I. PURPOSE:

This Program Directive reconfirms, clarifies, and simplifies Saturn V Program policy, responsibility, and procedures governing the

MANAGEMENT OF ENGINEERING CHANGES

to Saturn V hardware and software of:

- A. Flight Stages (S-IC, S-II, and S-IVB).
- B. Instrument Unit (IU).
- C. Launch Vehicle Ground Support Equipment (LVGSE) Contract End Items (Items which have an interface at KSC, see Definition on Page 3).

NOTE: This Revision #1 to Program Directive #12 supersedes the original issue of May 6, 1965.

II. SCOPE:

This Program Directive applies to:

- A. All Project Offices (Functional and Hardware) of the Saturn V Program Office.
- B. Research and Development Operations (R&DO).
- C. Saturn V Contractors.

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III. REFERENCES:

- A. Apollo Program Directive #18, dated May 4, 1966, Subject:
"Changes to Apollo Hardware and Software for Saturn/Apollo Applications."
- B. Saturn Configuration Management Manual, CM-002, 001-2H.

IV. DEFINITIONS:

For the Saturn V Program, the following definitions apply:

A. Baselines:

- 1. Design Requirements Baseline is the contractually implemented Part I of the Contract End Item (CEI) Specification or equivalent contractual documentation. The Part I CEI Specifications establish requirements peculiar to the design, development, test, and qualification of the end item.
- 2. Product Configuration Baseline is the contractually implemented Part II of the Contract End Item (CEI) Specification. The Part II CEI Specification establishes exact configuration information peculiar to the production, production testing/quality control, and preparation for delivery of each end item.

B. Engineering Changes:

- 1. Mandatory Change is a change required to:
 - Meet Contract End Item (CEI) Specifications (Part I CEI Specification prior to First Article Configuration Inspection [FACI] and Part I and II after FACI).
 - Meet Program Specifications.
 - Accomplish one or more of the following
 - Make it Work (Functionally)
 - Make it Fit (Physically)

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IV. DEFINITIONS: (Continued)

- Make it Safe (For Personnel and Equipment).

2. Cost Reduction Change is a change that reduces Saturn V Program Costs and:

- Does not adversely affect end item performance to the extent that specified requirements are not met.
- Does not adversely affect established schedule milestones.

3. Product Improvement Change is a change that improves schedule or performance beyond established program requirements.

C. An "Interface" at KSC is the specifically defined and located juncture or function between two or more hardware contract end items which are:

1. Under the design jurisdiction of different contractors or different government agencies at KSC.
2. Required to check out equipment or perform a service or function during prelaunch and launch operations.

V. POLICY:

A. The Block Configuration for Saturn V Vehicles is established as follows:

<u>Block I</u>	<u>Block II</u>	<u>Block III</u>
SA-501	SA-504	SA-516
SA-502	through	and
SA-503	SA-515	Subsequents

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Branch, Phone 877-2607/CJohnson**V. POLICY:** (Continued)**B. Engineering Changes to Saturn V Hardware and Software:****1. For Apollo Lunar Landing Program Primary Missions (Saturn V Block I and Block II Vehicles):**

- Shall be strictly controlled so that design requirements and Saturn V Program objectives can be attained within established cost and schedule constraints.
- Shall be processed in accordance with the Saturn Configuration Management Manual (CM-002, 001-2H).

2. To Accommodate Saturn/Apollo Application Program Missions (Specifically designated Saturn V Block II Vehicles):

- Shall be strictly controlled so that the Saturn/Apollo Manned Lunar Landing effort is not compromised by Saturn/Apollo Applications Program activity.
- Shall be processed through the Saturn V Program Level II Configuration Control Board (CCB):
 - To the Apollo Program Office Level I CCB in accordance with Apollo Program Directive #18, dated May 4, 1966, signed by the Apollo Program Director and the Acting Director, Saturn/Apollo Applications Program.
 - To either the NASA Administrator or Deputy Administrator for final approval.
- Shall be made at some point after delivery by the manufacturing contractor unless the following criteria are met:
 - Changes must not preclude or compromise the use of the hardware for an Apollo mission unless such hardware is formally transferred from the Apollo to the Saturn/Apollo Applications Program.

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V. POLICY: (Continued)

- Changes will not be approved to Apollo hardware during the manufacturing cycle which will interfere with the contractor's capability to meet performance, cost, schedule or manpower requirements necessary to perform the lunar landing mission on the earliest possible date.

3. Exclusively for Saturn/Apollo Applications Program Missions
(Saturn V Block III Vehicles):

- Shall be strictly controlled so that design requirements can be attained within cost and schedule constraints.
- Shall be processed through the Saturn V Level II CCB to the Apollo Applications Program Office. (The AAP Level I CCB has not yet been formalized.)

C. The Baseline for Engineering Changes to Hardware and Software is as follows:

1. Design Requirements Baseline: Part I CEI Specification shall be used as the baseline for change control on Saturn V Block I, II, and III Vehicles and LVGSE Contract End Items (Items which have an "Interface" at KSC).
2. Design Requirements Baseline: Part I CEI Specification and Product Configuration Baseline (Part II CEI Specification) shall both be used as the baseline for change control on:
 - SA-503 after FACI (to be accomplished prior to completion of Post Manufacturing Checkout).
 - LVGSE Contract End Items (Items which have an "Interface" at KSC) after FACI (to be accomplished prior to start of prelaunch operations with SA-501 at KSC).
 - Saturn V Block II and III Vehicles.

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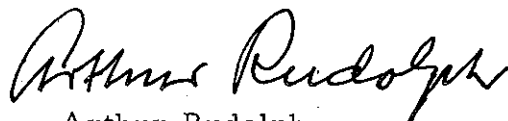
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VI. PROCEDURE:

The following procedures shall be complied with in the processing of all changes to Contract End Items in the Saturn V Program:

- A. Mandatory and Cost Reduction Engineering Changes shall be processed through the appropriate Saturn V CCB in accordance with the Saturn Configuration Management Manual and this directive.
- B. Product Improvement Engineering Changes shall be processed through the Saturn V Program Level II CCB.
 - Product improvement changes will not be considered for Block I and II Vehicles, therefore, shall not be submitted.
 - Product improvement engineering changes will be considered for Block III Vehicles.



Arthur Rudolph
Manager, Saturn V Program

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